

# SEQUENCE LISTING

<110> Khleif, Samir N.  
Berzofsky, Jay A.

<120> METHODS AND COMPOSITIONS FOR CO-STIMULATION OF  
IMMUNOLOGICAL RESPONSES TO PEPTIDE ANTIGENS

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<150> 60/189,396

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<160> 61

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<210> 1

<211> 35

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 1

Glu Gln Met His Glu Asp Ile Ile Ser Leu Trp Asp Gln Ser Leu Lys  
1 5 10 15

Pro Cys Val Lys Arg Ile Gln Arg Gly Pro Gly Arg Ala Phe Val Thr  
20 25 30

Ile Gly Lys  
35

<210> 2

<211> 39

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 2

Lys Gln Ile Ile Asn Met Trp Gln Glu Val Gly Lys Ala Met Tyr Ala  
1 5 10 15

Pro Pro Ile Ser Gly Gln Ile Arg Arg Ile Gln Arg Gly Pro Gly Arg  
20 25 30

Ala Phe Val Thr Ile Gly Lys  
35

<210> 3

<211> 39

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 3

Arg Asp Asn Trp Arg Ser Glu Leu Tyr Lys Tyr Lys Val Val Lys Ile  
1 5 10 15

Glu Pro Leu Gly Val Ala Pro Thr Arg Ile Gln Arg Gly Pro Gly Arg  
20 25 30

Ala Phe Val Thr Ile Gly Lys  
35

<210> 4

<211> 48

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 4

Ala Val Ala Glu Gly Thr Asp Arg Val Ile Glu Val Val Gln Gly Ala  
1 5 10 15

Tyr Arg Ala Ile Arg His Ile Pro Arg Arg Ile Arg Gln Gly Leu Glu  
20 25 30

Arg Arg Ile Gln Arg Gly Pro Gly Arg Ala Phe Val Thr Ile Gly Lys  
 35 40 45

<210> 5  
 <211> 42  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: HIV PEPTIDE  
 ANTIGEN

<400> 5  
 Asp Arg Val Ile Glu Val Val Gln Gly Ala Tyr Arg Ala Ile Arg His  
 1 5 10 15  
 Ile Pro Arg Arg Ile Arg Gln Gly Leu Glu Arg Arg Ile Gln Arg Gly  
 20 25 30  
 Pro Gly Arg Ala Phe Val Thr Ile Gly Lys  
 35 40

<210> 6  
 <211> 30  
 <212> PRT  
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<220>  
 <223> Description of Artificial Sequence: HIV PEPTIDE  
 ANTIGEN

<400> 6  
 Asp Arg Val Ile Glu Val Val Gln Gly Ala Tyr Arg Ala Ile Arg Arg  
 1 5 10 15  
 Ile Gln Arg Gly Pro Gly Arg Ala Phe Val Thr Ile Gly Lys  
 20 25 30

<210> 7  
 <211> 31  
 <212> PRT  
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Sequence

<220>

<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 7

Ala Gln Gly Ala Tyr Arg Ala Ile Arg His Ile Pro Arg Arg Ile Arg  
1 5 10 15

Arg Ile Gln Arg Gly Pro Gly Arg Ala Phe Val Thr Ile Gly Lys  
20 25 30

<210> 8

<211> 35

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 8

Glu Gln Met His Glu Asp Ile Ile Ser Leu Trp Asp Gln Ser Leu Lys  
1 5 10 15

Pro Cys Val Lys Arg Ile His Ile Gly Pro Gly Arg Ala Phe Tyr Thr  
20 25 30

Thr Lys Asn  
35

<210> 9

<211> 39

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 9

Lys Gln Ile Ile Asn Met Trp Gln Glu Val Gly Lys Ala Met Tyr Ala  
1 5 10 15

Pro Pro Ile Ser Gly Gln Ile Arg Arg Ile His Ile Gly Pro Gly Arg  
20 25 30

Ala Phe Tyr Thr Thr Lys Asn  
35

<210> 10

<211> 39

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 10

Arg Asp Asn Trp Arg Ser Glu Leu Tyr Lys Tyr Lys Val Val Lys Ile  
1 5 10 15

Glu Pro Leu Gly Val Ala Pro Thr Arg Ile His Ile Gly Pro Gly Arg  
20 25 30

Ala Phe Tyr Thr Thr Lys Asn  
35

<210> 11

<211> 48

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 11

Ala Val Ala Glu Gly Thr Asp Arg Val Ile Glu Val Val Gln Gly Ala  
1 5 10 15

Tyr Arg Ala Ile Arg His Ile Pro Arg Arg Ile Arg Gln Gly Leu Glu  
20 25 30

Arg Arg Ile His Ile Gly Pro Gly Arg Ala Phe Tyr Thr Thr Lys Asn  
35 40 45

<210> 12  
<211> 43  
<212> PRT  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 12

Asp Arg Val Ile Glu Val Val Gln Gly Ala Tyr Arg Ala Ile Arg His  
1 5 10 15

Ile Pro Arg Arg Ile Arg Gln Gly Leu Glu Arg Arg Ile His Ile Gly  
20 25 30

Pro Gly Arg Ala Phe Tyr Thr Thr Lys Ile Asn  
35 40

<210> 13  
<211> 30  
<212> PRT  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 13

Asp Arg Val Ile Glu Val Val Gln Gly Ala Tyr Arg Ala Ile Arg Arg  
1 5 10 15

Ile His Ile Gly Pro Gly Arg Ala Phe Tyr Thr Thr Lys Asn  
20 25 30

<210> 14  
<211> 31  
<212> PRT  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 14

Ala Gln Gly Ala Tyr Arg Ala Ile Arg His Ile Pro Arg Arg Ile Arg

1	5	10	15
Arg	Ile	His	Ile
Gly	Pro	Gly	Arg
Ala	Phe	Tyr	Thr
Thr	Thr	Lys	Asn
20	25	30	

<210> 15  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: HIV PEPTIDE  
 ANTIGEN

<400> 15
Arg
Ile
Gln
Arg
Gly
Pro
Gly
Arg
Ala
Phe
Val
Thr
Ile
Gly
Lys
1
5
10
15

<210> 16  
 <211> 10  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: HIV PEPTIDE  
 ANTIGEN

<400> 16
Arg
Gly
Pro
Gly
Arg
Ala
Phe
Val
Thr
Ile
1
5
10

<210> 17  
 <211> 10  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: HIV PEPTIDE  
 ANTIGEN

<400> 17
Ile
Gly
Pro
Gly
Arg
Ala
Phe
Tyr
Thr
Thr
1
5
10

<210> 18  
<211> 10  
<212> PRT  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 18  
Ile Gly Pro Gly Arg Ala Phe Tyr Ala Thr  
1 5 10

<210> 19  
<211> 10  
<212> PRT  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 19  
Lys Gly Pro Gly Arg Val Ile Tyr Ala Thr  
1 5 10

<210> 20  
<211> 10  
<212> PRT  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 20  
Ile Gly Pro Gly Arg Ala Phe His Thr Thr  
1 5 10

<210> 21  
<211> 10  
<212> PRT  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 21  
Ile Gly Pro Gly Arg Thr Leu Tyr Ala Arg  
1 5 10

<210> 22  
<211> 10  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 22  
Leu Gly Pro Gly Arg Val Trp Tyr Thr Thr  
1 5 10

<210> 23  
<211> 10  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 23  
Ile Gly Pro Gly Arg Ala Phe Arg Thr Arg  
1 5 10

<210> 24  
<211> 15  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 24  
Arg Ile Gln Arg Gly Pro Gly Arg Ala Phe Val Thr Ile Gly Lys  
1 5 10 15

<210> 25  
<211> 15  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 25  
Arg Ile His Ile Gly Pro Gly Arg Ala Phe Tyr Thr Thr Lys Asn  
1 5 10 15

<210> 26  
<211> 15  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 26  
Ser Ile Thr Lys Gly Pro Gly Arg Val Ile Tyr Ala Thr Gly Gln  
1 5 10 15

<210> 27  
<211> 15  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 27  
Ser Ile His Ile Gly Pro Gly Pro Ala Phe Tyr Ala Thr Gly Asp  
1 5 10 15

<210> 28  
<211> 15  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 28  
Ser Leu Ser Ile Gly Pro Gly Arg Ala Phe Arg Thr Arg Glu Ile  
1 5 10 15

<210> 29  
<211> 15  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 29  
Ser Ile Ser Ile Gly Pro Gly Arg Ala Phe Phe Ala Thr Thr Asp  
1 5 10 15

<210> 30  
<211> 15  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 30  
Ser Ile Tyr Ile Gly Pro Gly Arg Ala Phe His Thr Thr Gly Arg  
1 5 10 15

<210> 31  
<211> 15  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 31

Gly	Ile	Ala	Ile	Gly	Pro	Gly	Arg	Thr	Leu	Tyr	Ala	Arg	Glu	Lys
1				5					10					15

<210> 32  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: HIV PEPTIDE  
 ANTIGEN

Arg	Val	Thr	Ile	Gly	Pro	Gly	Arg	Val	Trp	Tyr	Thr	Thr	Gly	Glu
1				5					10					15

<210> 33  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: HIV PEPTIDE  
 ANTIGEN

Ser	Ile	Arg	Ile	Gly	Pro	Gly	Lys	Val	Phe	Thr	Ala	Lys	Gly	Gly
1				5					10					15

<210> 34  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: HIV PEPTIDE  
 ANTIGEN

Gly	Ile	His	Phe	Gly	Pro	Gly	Gln	Ala	Leu	Tyr	Thr	Thr	Gly	Ile
1				5					10					15

<210> 35  
 <211> 14

<212> PRT  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 35

Ser Thr Pro Ile Gly Leu Gly Gln Met Tyr Thr Thr Arg Gly  
1 5 10

<210> 36

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 36

Ser Thr Pro Ile Gly Leu Gly Gln Ala Leu Tyr Thr Thr Arg Ile  
1 5 10 15

<210> 37

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 37

Arg Thr Pro Thr Gly Leu Gly Gln Ser Leu Tyr Thr Thr Arg Ser  
1 5 10 15

<210> 38

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 38  
Gln Ile Asp Ser Lys Leu Arg Glu Gln Phe Gly Asn Asn Lys  
1 5 10

<210> 39  
<211> 20  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 39  
Gly Ser Asp Thr Ile Thr Leu Pro Cys Arg Ile Lys Gln Phe Ile Asn  
1 5 10 15

Met Trp Gln Glu  
20

<210> 40  
<211> 15  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 40  
Asn Tyr Thr Ser Leu Ile His Ser Leu Ile Glu Glu Ser Gln Asn  
1 5 10 15

<210> 41  
<211> 15  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 41  
Glu Gln Glu Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu Trp Asn

1 5 10 15

<210> 42  
<211> 15  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 42  
Arg Ile Val Glu Leu Leu Gly Arg Arg Gly Trp Glu Ala Leu Lys  
1 5 10 15

<210> 43  
<211> 25  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 43  
Ile Glu Thr Val Pro Val Lys Leu Lys Pro Gly Met Asp Gly Pro Lys  
1 5 10 15

Val Lys Gln Trp Pro Leu Thr Glu Glu  
20 25

<210> 44  
<211> 25  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 44  
Ala Ile Phe Gln Ser Ser Met Thr Lys Ile Leu Glu Pro Phe Arg Lys  
1 5 10 15

Gln Asn Pro Asp Ile Val Ile Tyr Gln

<210> 45

<211> 25

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 45

Asn Pro Asp Ile Val Ile Tyr Gln Tyr Met Asp Asp Leu Tyr Val Gly  
1 5 10 15

Ser Asp Leu Glu Ile Gly Gln His Arg  
20 25

<210> 46

<211> 25

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 46

Asp Leu Glu Ile Gly Gln His Arg Thr Lys Ile Glu Glu Leu Arg Gln  
1 5 10 15

His Leu Leu Arg Trp Gly Leu Thr Thr  
20 25

<210> 47

<211> 25

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 47

Pro Leu Thr Glu Glu Ala Glu Leu Glu Leu Ala Glu Asn Arg Glu Ile

1

5

10

15

Leu Lys Glu Pro Val His Gly Val Tyr  
20 25

&lt;210&gt; 48

&lt;211&gt; 25

&lt;212&gt; PRT

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

&lt;400&gt; 48

Glu Ile Gln Lys Gln Gly Gln Gly Gln Trp Thr Tyr Gln Ile Tyr Gln  
1 5 10 15

Glu Pro Phe Lys Asn Leu Lys Thr Gly  
20 25

&lt;210&gt; 49

&lt;211&gt; 9

&lt;212&gt; PRT

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

&lt;400&gt; 49

Asn Pro Asp Ile Val Ile Tyr Gln Tyr  
1 5

&lt;210&gt; 50

&lt;211&gt; 9

&lt;212&gt; PRT

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

&lt;400&gt; 50

Phe Pro Val Arg Pro Gln Val Pro Leu

1

5

<210> 51

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 51

Thr Pro Pro Leu Val Lys Leu Trp Tyr

1

5

<210> 52

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 52

Glu Pro Ile Val Gly Ala Glu Thr Phe Tyr

1

5

10

<210> 53

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 53

Ser Pro Ala Ile Phe Gln Ser Ser Met

1

5

<210> 54

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 54

Tyr Pro Leu Thr Phe Gly Trp Cys Phe  
1 5

<210> 55

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 55

Glu Pro Ile Val Gly Ala Glu Thr Phe  
1 5

<210> 56

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 56

Val Pro Leu Asp Lys Asp Phe Arg Lys Tyr  
1 5 10

<210> 57

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 57  
Arg Pro Gln Val Pro Leu Arg Pro Met Thr Tyr  
1 5 10

<210> 58  
<211> 9  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 58  
Ile Pro Leu Thr Glu Glu Ala Glu Leu  
1 5

<210> 59  
<211> 9  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 59  
Asp Pro Asn Pro Gln Glu Val Val Leu  
1 5

<210> 60  
<211> 9  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 60  
Arg Pro Ile Val Ser Thr Gln Leu Leu  
1 5

<210> 61

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV PEPTIDE  
ANTIGEN

<400> 61

Leu Pro Cys Arg Ile Lys Gln Ile Ile

1

5